Claims

1. Combined demultiplexer and interpolator, **characterized** in
that it receives a time multiplex of N signals and in that it
5   generates N channels at 1/D times the speed of the time
multiplex, where D is an integer divider of N.

2. Combined demultiplexer and interpolator according to claim
1, **characterized** in that it receives a four signal time
10   multiplex and in that it generates four channels at half the
speed of the time multiplex.

3. Differential phase detector for generating a tracking error
signal from the digitized signals (A, B, C, D) of four
15   photodetectors, including a multiplexer for time multiplexing
the digitized signals (A, B, C, D), **characterized** in that it
includes a demultiplexer / interpolator for synchronizing the
samples from the time multiplexed digitized signals (A, B, C,
D).
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4. Differential phase detector according to claim 3,
characterized in that it includes summing means for summing the
synchronized samples of the demultiplexer / interpolator to
generate a data signal (HF).
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5. Differential phase detector according to claim 3 or 4,
further including means for compensating an attenuation of high
signal frequencies caused by the interpolation.

30   6. Differential phase detector according to one of claims 3 to
5, **characterized** in that the demultiplexer /interpolator
receives a time multiplex of N signals and in that it generates
N channels at 1/D times the speed of the time multiplex, where
D is an integer divider of N.
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7. Differential phase detector according to claim 6, **characterized** in that the demultiplexer /interpolator receives a four signal time multiplex and in that it generates four channels at half the speed of the time multiplex.

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8. Method for combined demultiplexing and interpolating, **including** the steps of:
- receiving a time multiplex of N signals, and
- generating N channels at 1/D times the speed of the time
10 multiplex, where D is an integer divider of N.

9. Method for differential phase detection, **including** the steps of:
- digitizing the output signals (A, B, C and D) of four
15 photodetectors,
- time multiplexing the digitized signals (A, B, C, D),
- synchronizing the samples from the time multiplexed digitized signals (A, B, C, D) with a demultiplexer / interpolator, and
- generating a tracking error signal from the digitized and
20 synchronized signals (A, B, C, D)

10. Apparatus for reading from and/or writing to optical recording media, **characterized** in that it includes a differential phase detector according to one of claims 3 to 7
25 or performs a method according to claim 9 for differential phase detection.